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EXAMINER

BARTH, VINCENT P

ART UNIT PAPER NUMBER

2877

DATE MAILED: 03/10/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/092,599

Applicant(s)

SAKITA, RYUUJI

Examiner

Vincent P. Barth

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 March 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-190 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-190 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Specification

1. The listing of references in the Specification is not a proper information disclosure statement, as Applicants have set forth such references on pages 1-5 in the Specification of the instant Application. 37 CFR 1.98(b) requires a list of all patents, publications, or other information submitted for consideration by the Office, and MPEP § 609 A(1) states that the list may not be incorporated into the specification but must be submitted in a separate paper. Applicants must provide a completed form PTO-1449 with such references listed, and provide copies of such references with English translations of at least the abstracts, preferably concurrent with the reply to the instant Office Action.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claim 1-190 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

4. Referring to Claims 1, 17, 25, 33, 41, 49, 57, 65, 83, 95, 107, 119, 131, 141, 143, 155, 167 and 179, the term “stereoscopic lattice” is used, which renders the claims indefinite. The plain and ordinary meaning of stereoscopic in the field of optics is a system with two cameras

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viewing scenes (i.e., stereo-two and scopic-view). However, the claims cited identify only a single camera in the system, thereby creating an ambiguity. The term stereoscopic lattice is not used in the field of Moire fringe systems, thus leaving any particular definitions to Applicant to define in the disclosure. However, the discussion in the Specification on pages 2 and 3 does not adequately resolve the issue. The Examiner respectfully requests that Applicant either amend the claims, or provide a suitable explanation responsive to the issue as presented herein, preferably citing particular portions of the Specification and/or Drawings in support thereof. Moreover, upon reviewing a reply to the instant Office Action concerning this matter, further consideration of the claims on the merits will follow such reply. In the event that Applicant discusses a stereoscopic system in terms of a plurality of cameras, please note that the primary reference cited below, Shirley, discloses embodiments with either a single camera or a plurality of cameras. Therefore, in the interest of compact prosecution, Applicant should perhaps address distinctions between the instant invention and the Shirley reference (with respect to stereoscopy), if any, in reply to the instant Office Action. However, the claims have been discussed below, as each may best be understood, and as if a single camera were used in the Moire system.

5. Referring to Claims 2-16, 18-24, 26-32, 34-40, 42-48, 50-56, 58-64, 66-82, 84-94, 96-106, 108-118, 120-130, 132-140, 142, 144-154, 156-166, 168-178 and 180-190, the fourth paragraph of 35 U.S.C. §112 provides that, "A claim in dependent form shall be construed to incorporate by reference all the limitations of the claim to which it refers". Accordingly, Claim 2-16, 18-24, 26-32, 34-40, 42-48, 50-56, 58-64, 66-82, 84-94, 96-106, 108-118, 120-130, 132-140, 142, 144-154, 156-166, 168-178 and 180-190 inherit the §112 second paragraph rejection of Claims 1, 17, 25, 33, 41, 49, 57, 65, 83, 95, 107, 119, 131, 141, 143, 155, 167 and 179, and is/are

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therefore rejected as well. However, the claims have been discussed below, as each may best be understood.

6. Referring to Claims 6, 13 and 65, the term, “measurement range” is used, which renders the claims indefinite. It is not clear which “range” is being addressed in the claims. The Examiner respectfully requests that Applicant either amend the claims, or provide a suitable explanation responsive to the issue as presented herein, preferably citing particular portions of the Specification and/or Drawings in support thereof.

7. Referring to Claims 25, 41, 57, 95, 119 and 143, the phrase, “stepped lattice pattern” said ... three stepped lattice surfaces different in height” is used, which renders the claims indefinite. Based in part on the difficulties discussed above with lattices, the configuration of the device structure (i.e., lattices) being manipulated to perform the steps in the method are not clear. The Examiner respectfully requests that Applicant either amend the claims, or provide a suitable explanation responsive to the issue as presented herein, preferably citing particular portions of the Specification and/or Drawings in support thereof. However, the claim has been discussed below, as it may best be understood.

8. Referring to Claims 67-69 and 75-77, in view of the difficulties with the lattice discussed above, the particular shifting and distance varying mechanism configurations are not clear. Accordingly, the Examiner respectfully requests that Applicant either amend the claims, or provide a suitable explanation responsive to the issue as presented herein, preferably citing particular portions of the Specification and/or Drawings in support thereof.

9. Referring to Claims 71, 79, 86, 91, 98, 103, 110, 115, 122, 127, 134, 139, 146, 151, 158, 163, 170, 175, 182 and 187, the limitation in which the workpiece is flat renders the claims

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indefinite. Certainly, the geometric configuration in which a workpiece is flat is clear.

However, in general, the Moire fringe system for determining a surface contours, and provides data for all surface contours, except flat surfaces, in which no fringe patterns appear (i.e., no data is generated for flat surfaces). The Examiner respectfully requests that Applicant either amend the claims, or provide a suitable explanation responsive to the issue as presented herein, preferably citing particular portions of the Specification and/or Drawings in support thereof.

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claims 1-5, 7-12, 14-64, 66, 70, 72-74, 78, 80-85, 87-90, 92-97, 99-102, 104-109, 111-114, 116-121, 123-126, 128-133, 135-138, 140-145, 147-150, 152-157, 159-162, 164-169, 171-174, 176-181, 183-186, 188-190 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shirley, U.S. Pat. No. 6,609,474 (10 Feb. 2004).

12. Referring to Claim 1, Shirley discloses a system for determining the contour of an object surface using Moire fringe patterns, in which Moire optics (col. 31, lns. 34-57; col. 35, lns. 26-68) is incident upon an object to determine a three-dimensional surface configuration (col. 32, ln.

14). Shirley discloses that the Moire image data may produce variable phase shifts of 90

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degrees, 180 degrees and 270 degrees (col. 38, lns. 6-9), and has at least one or a plurality of camera detectors to image the Moire patterns (col. 12, lns. 28-30).

13. Referring to Claim 2, Shirley discloses that the at least one or a plurality of camera detectors to image the Moire patterns may image the entire object surface area, or particular regions (i.e., zones) of interest (col. 12, lns. 28-30).

14. Referring to Claims 3-5, Shirley discloses Shirley discloses that the Moire image data may produce variable phase shifts of 90 degrees, 180 degrees and 270 degrees (col. 38, lns. 6-9).

15. Referring to Claims 7 and 14, Shirley discloses the detectors may be in the form of an array of linear detectors (col. 33, lns. 63-66).

16. Referring to Claims 8 and 15, Shirley discloses that the at least one or a plurality of camera detectors to image the Moire patterns may image the entire object surface area (i.e., and area camera sensor) (col. 12, lns. 28-30).

17. Referring to Claims 9 and 16, Shirley discloses that the Moire grating may be formed of a liquid crystal system (col. 37, lns. 43-48).

18. Referring to Claims 10-12, Shirley discloses that the Moire image data may produce variable phase shifts of 90 degrees, 180 degrees and 270 degrees (col. 38, lns. 6-9).

19. Referring to Claims 17, 25, 49 and 57, Shirley discloses a system for determining the contour of a object surface using Moire fringe patterns, in which Moire optics (col. 31, lns. 34-57; col. 35, lns. 26-68) is incident upon an object to determine a three-dimensional surface configuration (col. 32, ln. 14). Shirley discloses that the Moire image data may produce variable phase shifts of 90 degrees, 180 degrees and 270 degrees (col. 38, lns. 6-9), and has at least one or a plurality of camera detectors to image the Moire patterns (col. 12, lns. 28-30).

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20. Referring to Claims 18, 26, 50 and 58, Shirley discloses that the at least one or a plurality of camera detectors to image the Moire patterns may image the entire object surface area, or particular regions (i.e. zones) of interest (col. 12, lns. 28-30).

21. Referring to Claims 19, 22, 27, 51, 54, 59 and 62, Shirley discloses the detectors may be in the form of an array of linear detectors (col. 33, lns. 63-66).

22. Referring to Claims 20, 23, 28, 31, 52, 55, 60 and 63, Shirley discloses that the at least one or a plurality of camera detectors to image the Moire patterns may image the entire object surface area (i.e., and area camera sensor) (col. 12, lns. 28-30).

23. Referring to Claims 21, 24, 29, 32, 53, 56, 61 and 64, Shirley discloses that the Moire grating may be formed of a liquid crystal system (col. 37, lns. 43-48).

24. Referring to Claims 33 and 41, Shirley discloses a system for determining the contour of a object surface using Moire fringe patterns, in which Moire optics (col. 31, lns. 34-57; col. 35, lns. 26-68) is incident upon an object to determine a three-dimensional surface configuration (col. 32, ln. 14). Shirley discloses that the Moire image data may produce variable phase shifts of 90 degrees, 180 degrees and 270 degrees (col. 38, lns. 6-9), and has at least one or a plurality of camera detectors to image the Moire patterns (col. 12, lns. 28-30). Shirley does not explicitly disclose that the camera or CCD is a color camera or CCD. However, the inclusion of a color camera for such purpose would have been obvious to those skilled in the art at the time of the invention based on the ubiquitous nature of such color CCD cameras, and the generally known developments state of the art in CCD technology. See In re Raynes, 28 USPQ2d 1630 at 1632, and MPEP §2144.03.

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25. Referring to Claims 34 and 42, Shirley discloses that the at least one or a plurality of camera detectors to image the Moire patterns may image the entire object surface area, or particular regions (i.e. zones) of interest (col. 12, lns. 28-30).

26. Referring to Claims 35, 38, 43 and 46, Shirley discloses the detectors may be in the form of an array of linear detectors (col. 33, lns. 63-66).

27. Referring to Claims 36, 39, 44 and 47, Shirley discloses that the at least one or a plurality of camera detectors to image the Moire patterns may image the entire object surface area (i.e., and area camera sensor) (col. 12, lns. 28-30).

28. Referring to Claims 37, 40, 45 and 48, Shirley discloses that the Moire grating may be formed of a liquid crystal system (col. 37, lns. 43-48).

29. Referring to Claims 65, 83 and 95, Shirley discloses a system for determining the contour of a object surface using Moire fringe patterns, in which Moire optics (col. 31, lns. 34-57; col. 35, lns. 26-68) is incident upon an object to determine a three-dimensional surface configuration (col. 32, ln. 14). Shirley discloses that the Moire image data may produce variable phase shifts of 90 degrees, 180 degrees and 270 degrees (col. 38, lns. 6-9), and has at least one or a plurality of camera detectors to image the Moire patterns (col. 12, lns. 28-30). Shirley does not explicitly disclose that the camera or CCD is a color camera or CCD. Shirley discloses a processor unit 28 for processing the Moire fringe patterns so as to determine the three-dimensional surface contours of an object (see Fig. 1, et seq.)

30. Referring to Claims 66, 84 and 96, Shirley discloses that the at least one or a plurality of camera detectors to image the Moire patterns may image the entire object surface area, or particular regions (i.e. zones) of interest (col. 12, lns. 28-30).

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31. Referring to Claims 70, 78, 85, 90, 97 and 102, Shirley discloses a system for determining the contour of a object surface using Moire fringe patterns, in which Moire optics (col. 31, lns. 34-57; col. 35, lns. 26-68) is incident upon an object to determine a three-dimensional surface configuration (col. 32, ln. 14). Shirley does not explicitly disclose any particular shape, such as a cylinder, from which contour data is derived. However, in general, Moire fringe pattern data may derive the contour of objects of any shape. Therefore, implicit in the Shirley disclosure is that cylinders may be measured. See MPEP §2144.01.

32. Referring to Claims 72, 80, 87, 92, 99 and 104, Shirley discloses the detectors may be in the form of an array of linear detectors (col. 33, lns. 63-66).

33. Referring to Claims 73, 81, 88, 93, 100 and 105, Shirley discloses that the at least one or a plurality of camera detectors to image the Moire patterns may image the entire object surface area (i.e., and area camera sensor) (col. 12, lns. 28-30).

34. Referring to Claims 74, 82, 89, 94, 101 and 106, Shirley discloses that the Moire grating may be formed of a liquid crystal system (col. 37, lns. 43-48).

35. Referring to Claims 107 and 119, Shirley discloses a system for determining the contour of a object surface using Moire fringe patterns, in which Moire optics (col. 31, lns. 34-57; col. 35, lns. 26-68) is incident upon an object to determine a three-dimensional surface configuration (col. 32, ln. 14). Shirley discloses that the Moire image data may produce variable phase shifts of 90 degrees, 180 degrees and 270 degrees (col. 38, lns. 6-9), and has at least one or a plurality of camera detectors to image the Moire patterns (col. 12, lns. 28-30). Shirley discloses a processor unit 28 for processing the Moire fringe patterns so as to determine the three-dimensional surface contours of an object (see Fig. 1, et seq.) Shirley does not explicitly disclose

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that the camera or CCD is a color camera or CCD. However, the inclusion of a color camera for such purpose would have been obvious to those skilled in the art at the time of the invention based on the ubiquitous nature of such color CCD cameras, and the generally known developments state of the art in CCD technology. See In re Raynes, 28 USPQ2d 1630 at 1632, and MPEP §2144.03.

36. Referring to Claims 108 and 120, Shirley discloses that the at least one or a plurality of camera detectors to image the Moire patterns may image the entire object surface area, or particular regions (i.e. zones) of interest (col. 12, lns. 28-30).

37. Referring to Claims 109, 114, 121 and 126, Shirley discloses a system for determining the contour of a object surface using Moire fringe patterns, in which Moire optics (col. 31, lns. 34-57; col. 35, lns. 26-68) is incident upon an object to determine a three-dimensional surface configuration (col. 32, ln. 14). Shirley does not explicitly disclose any particular shape, such as a cylinder, from which contour data is derived. However, in general, Moire fringe pattern data may derive the contour of objects of any shape. Therefore, implicit in the Shirley disclosure is that cylinders may be measured. See MPEP §2144.01.

38. Referring to Claims 111, 116, 123 and 128, Shirley discloses the detectors may be in the form of an array of linear detectors (col. 33, lns. 63-66).

39. Referring to Claims 112, 117, 124 and 129, Shirley discloses that the at least one or a plurality of camera detectors to image the Moire patterns may image the entire object surface area (i.e., and area camera sensor) (col. 12, lns. 28-30).

40. Referring to Claims 113, 118, 125 and 130, Shirley discloses that the Moire grating may be formed of a liquid crystal system (col. 37, lns. 43-48).

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41. Referring to Claims 131, 143, 155, 167 and 179, Shirley discloses a system for determining the contour of a object surface using Moire fringe patterns, in which Moire optics (col. 31, lns. 34-57; col. 35, lns. 26-68) is incident upon an object to determine a three-dimensional surface configuration (col. 32, ln. 14). Shirley discloses that the Moire image data may produce variable phase shifts of 90 degrees, 180 degrees and 270 degrees (col. 38, lns. 6-9), and has at least one or a plurality of camera detectors to image the Moire patterns (col. 12, lns. 28-30). Shirley does not explicitly disclose that the camera or CCD is a color camera or CCD. Shirley discloses a processor unit 28 for processing the Moire fringe patterns so as to determine the three-dimensional surface contours of an object (see Fig. 1, et seq.)

42. Referring to Claims 132, 144, 156, 168 and 180, Shirley discloses that the at least one or a plurality of camera detectors to image the Moire patterns may image the entire object surface area, or particular regions (i.e. zones) of interest (col. 12, lns. 28-30).

43. Referring to Claims 133, 138, 145, 150, 157, 162, 169, 174, 181 and 186, Shirley discloses a system for determining the contour of a object surface using Moire fringe patterns, in which Moire optics (col. 31, lns. 34-57; col. 35, lns. 26-68) is incident upon an object to determine a three-dimensional surface configuration (col. 32, ln. 14). Shirley does not explicitly disclose any particular shape, such as a cylinder, from which contour data is derived. However, in general, Moire fringe pattern data may derive the contour of objects of any shape. Therefore, implicit in the Shirley disclosure is that cylinders may be measured. See MPEP §2144.01.

44. Referring to Claims 135, 140, 147, 152, 159, 164, 171, 176, 183 and 188, Shirley discloses the detectors may be in the form of an array of linear detectors (col. 33, lns. 63-66).

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45. Referring to Claims 136, 141, 148, 153, 160, 165, 172, 177, 184 and 189, Shirley discloses that the at least one or a plurality of camera detectors to image the Moire patterns may image the entire object surface area (i.e., and area camera sensor) (col. 12, lns. 28-30).

46. Referring to Claims 137, 142, 149, 154, 161, 166, 173, 178, 185 and 190, Shirley discloses that the Moire grating may be formed of a liquid crystal system (col. 37, lns. 43-48).


Comments

47. The following claims have been drafted with dependency not consistent with the overall structure of the other claims, therefore such dependencies were perhaps typographical errors. Claim 61 has been drafted to depend from Claim 55 (rather than 58), and Claim 142 depends from Claim 131 (rather than Claim 141). The Examiner respectfully requests a very brief comment on this issue from Applicant.

48. In a matter relating to form, throughout the Specification and Claims the term, “tridimensional” is used instead of “three dimensional”, and “work” is used instead of “workpiece”. Although not forming the basis of an objection, it is strongly suggested that at least the term “tridimensional” be amended if the Application proceeds further in prosecution. Such terms, especially “tridimensional”, will result in difficulties for those searching the instant invention as prior art in the future, and may thereby have an adverse effect on the instant invention.

CONCLUSION

49. Applicants' Claims 1-190 are rejected based on the reasons set forth above.
50. Any inquiries concerning this communication from the Examiner should be directed to Vincent P. Barth, whose telephone number is 571-272-2410, and who may be ordinarily reached from 9:00 a.m. to 5:30 p.m., Monday through Friday. The fax number for the group before final actions is 703-872-9306.
51. If attempts to reach the Examiner prove unsuccessful, the Examiner's supervisor is Frank G. Font, who may be reached at 571-272-2415.
52. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-1782.



Richard A. Rosenberg
Primary Examiner